

Amendments to the Claims

Claim 1 (Currently Amended) A digital broadcast receiving apparatus for amplifying a digital modulated signal wave propagated through air with gain automatically adjusted to have a predetermined amplitude, and demodulating the digital modulated signal wave to a digital signal, the digital broadcast receiving apparatus comprising:

tuner means for frequency-converting the digital modulated signal wave into a first modulated signal;

first automatic gain control amplification means for controlling gain of said tuner means to make a level of the first modulated signal at a first predetermined level;

A/D conversion means for converting, analog to digital, the first modulated signal into a second modulated signal;

demodulation means for demodulating the second modulated signal into a first demodulated digital signal; and

second automatic gain control amplification means for amplifying a level of the first demodulated digital signal to be at a second predetermined level, and generating a second demodulated digital signal, wherein

the second automatic gain control amplification means includes:

multiplication means for receiving the first demodulated digital signal and an automatic gain control signal, multiplying the first demodulated digital signal by the automatic gain control signal, and outputting the multiplied signal as the second demodulated digital signal;

level detection means for receiving the second demodulated digital signal directly ~~outputted~~ from the multiplication means, detecting a level of the second demodulated digital signal, and generating a level signal representing the level of the second demodulated digital signal; and

automatic gain control signal generation means for receiving the level signal representing the level of the second demodulated digital signal, generating the automatic gain control signal based on the received level signal, and outputting the automatic gain control signal to the multiplication means.

Claim 2 (Previously Presented) The digital broadcast receiving apparatus according to claim 1, wherein

said first automatic gain control amplification means controls amplification of the digital modulated signal wave without following frequency fluctuations thereof for generation of the first modulated signal.

Claim 3 (Previously Presented) A digital broadcast receiving apparatus for amplifying a digital modulated signal wave propagated through air with gain automatically adjusted to have a predetermined amplitude, and demodulating the digital modulated signal wave to a digital signal, the digital broadcast receiving apparatus comprising:

tuner means for frequency-converting the digital modulated signal wave into a first modulated signal;

first automatic gain control amplification means for controlling gain of said tuner means to make a level of the first modulated signal at a first predetermined level;

A/D conversion means for converting, analog to digital, the first modulated signal into a second modulated signal;

demodulation means for demodulating the second modulated signal into a first demodulated digital signal; and

second automatic gain control amplification means for amplifying a level of the first demodulated digital signal by following frequency fluctuations thereof to be at a second predetermined level, and generating a second demodulated digital signal, wherein

said first automatic gain control amplification means controls amplification of the digital modulated signal wave by following frequency fluctuations thereof that are smaller than a first predetermined frequency for generation of the first modulated signal, and said second automatic gain control amplification means amplifies the first demodulated digital signal by following frequency fluctuations thereof under a second predetermined frequency that is larger than the first predetermined frequency, and generates the second demodulated digital signal.

Claim 4 (Previously Presented) The digital broadcast receiving apparatus according to claim 3, wherein the first automatic gain control amplification means comprises:

level detection means for detecting a level of the second modulated signal; and

gain change means for changing the gain of said tuner means based on the detected level.

Claim 5 (Previously Presented) The digital broadcast receiving apparatus according to claim 4, wherein

said gain change means uses, as the gain, a first predetermined value when the detected level is higher than a threshold, and a second predetermined value smaller than the first predetermined value when the detected level is lower than the threshold, and

the threshold is a threshold voltage at which a control-voltage to amplitude-attenuation characteristic of said tuner means is abruptly changed.

Claim 6 (Previously Presented) The digital broadcast receiving apparatus according to claim 4, wherein

said gain change means uses, as the gain, a first predetermined value when the detected level is lower than a first threshold, a second predetermined value larger than the first predetermined value when the detected level is higher than a second threshold, and one of the first and second predetermined values based on a value immediately before the detected level when the detected level is higher than the first threshold and lower than the second threshold,

the first threshold is a voltage lower, by a first predetermined amount, than a threshold voltage at which a control-voltage to amplitude-attenuation characteristic of said tuner means is abruptly changed, and

the second threshold is a voltage lower, by a second predetermined amount, than the threshold voltage.

Claim 7 (Canceled)

Claim 8 (Currently Amended) A digital broadcast receiving apparatus for amplifying a digital modulated signal wave propagated through air with gain automatically adjusted to have a predetermined amplitude, and demodulating the digital modulated signal wave to a digital signal, the digital broadcast receiving apparatus comprising:

a tuner operable to frequency-convert the digital modulated signal wave into a first modulated signal;

a first automatic gain controller operable to control gain of said tuner to make a level of the first modulated signal at a first predetermined level;

an A/D converter operable to convert, analog to digital, the first modulated signal into a second modulated signal;

a demodulator operable to demodulate the second modulated signal into a first demodulated digital signal; and

a second automatic gain controller operable to amplify a level of the first demodulated digital signal to be at a second predetermined level, and generate a second demodulated digital signal, wherein

the second automatic gain controller includes:

a multiplier operable to receive the first demodulated digital signal and an automatic gain control signal, multiply the first demodulated digital signal by the automatic gain control signal, and output the multiplied signal as the second demodulated digital signal;

a level detector operable to receive the second demodulated digital signal directly ~~outputted from the multiplication means~~ multiplier, detect a level of the second demodulated digital signal, and generate a level signal representing the level of the second demodulated digital signal; and

automatic gain control signal generator operable to receive the level signal representing the level of the second demodulated digital signal, generate the automatic gain control signal based on the received level signal, and output the automatic gain control signal to the multiplier.

Claim 9 (Previously Presented) The digital broadcast receiving apparatus according to claim 8, wherein

said first automatic gain controller controls amplification of the digital modulated signal wave without following frequency fluctuations thereof for generation of the first modulated signal.

Claim 10 (Previously Presented) A digital broadcast receiving apparatus for amplifying a digital modulated signal wave propagated through air with gain automatically adjusted to have a

predetermined amplitude, and demodulating the digital modulated signal wave to a digital signal, the digital broadcast receiving apparatus comprising:

- a tuner operable to frequency-convert the digital modulated signal wave into a first modulated signal;

- a first automatic gain controller operable to control gain of said tuner to make a level of the first modulated signal at a first predetermined level;

- an A/D converter operable to convert, analog to digital, the first modulated signal into a second modulated signal;

- a demodulator operable to demodulate the second modulated signal into a first demodulated digital signal; and

- a second automatic gain controller operable to amplify a level of the first demodulated digital signal by following frequency fluctuations thereof to be at a second predetermined level, and generate a second demodulated digital signal, wherein

- said first automatic gain controller controls amplification of the digital modulated signal wave by following frequency fluctuations thereof that are smaller than a first predetermined frequency for generation of the first modulated signal, and said second automatic gain controller amplifies the first demodulated digital signal by following frequency fluctuations thereof under a second predetermined frequency that is larger than the first predetermined frequency, and generates the second demodulated digital signal.

Claim 11 (Previously Presented) The digital broadcast receiving apparatus according to claim 10, wherein the first automatic gain controller comprising:

- a level detector operable to detect a level of the second modulated signal; and

- a signal generator operable to change the gain of said tuner based on the detected level.

Claim 12 (Previously Presented) The digital broadcast receiving apparatus according to claim 11, wherein the first automatic gain controller further comprises:

- a level decision unit operable to compare the detected level to a threshold voltage, as a threshold, at which a control-voltage to amplitude-attenuation characteristic of said tuner is abruptly changed, and control said signal generator to use, as the gain, a first predetermined

value when the detected level is higher than the threshold, and a second predetermined value smaller than the first predetermined value when the detected level is lower than the threshold.

Claim 13 (Previously Presented) The digital broadcast receiving apparatus according to claim 11, wherein the first automatic gain controller comprises:

a level decision unit operable to compare the detected level to a first voltage, as a first threshold, lower, by a first predetermined amount, than a threshold voltage at which a control-voltage to amplitude-attenuation characteristic of said tuner is abruptly changed and a second voltage, as a second threshold, lower, by a second predetermined amount, than the threshold voltage, and control said signal generator to use, as the gain, a first predetermined value when the detected level is lower than the first threshold, a second predetermined value larger than the first predetermined value when the detected level is higher than the second threshold, and one of the first and second predetermined values based on a value immediately before the detected level when the detected level is higher than the first threshold and lower than the second threshold.

Claim 14 (Currently Amended) ~~A~~ The digital broadcast receiving apparatus according to claim 1 for amplifying a digital modulated signal wave propagated through air with gain automatically adjusted to have a predetermined amplitude, and demodulating the digital modulated signal wave to a digital signal, the digital broadcast receiving apparatus comprising:

tuner means for frequency-converting the digital modulated signal wave into a first modulated signal;

first automatic gain control amplification means for controlling gain of said tuner means to make a level of the first modulated signal at a first predetermined level;

A/D conversion means for converting, analog to digital, the first modulated signal into a second modulated signal;

demodulation means for demodulating the second modulated signal into a first demodulated digital signal; and

second automatic gain control amplification means for amplifying a level of the first demodulated digital signal to be at a second predetermined level, and generating a second demodulated digital signal, wherein

the second automatic gain control amplification means includes:

multiplication means for receiving the first demodulated digital signal and an automatic gain control signal, multiplying the first demodulated digital signal by the automatic gain control signal, and outputting the multiplied signal as the second demodulated digital signal;

level detection means for receiving the second demodulated digital signal outputted from the multiplication means, detecting a level of the second demodulated digital signal, and generating a level signal representing the level of the second demodulated digital signal; and

automatic gain control signal generation means for receiving the level signal representing the level of the second demodulated digital signal, generating the automatic gain control signal based on the received level signal, and outputting the automatic gain control signal to the multiplication means.

the first automatic gain control amplification means includes:

level detection means for receiving the second modulated signal outputted from the A/D conversion means, detecting a level of the second modulated signal, and generating a level signal representing the level of the second modulated signal; and

automatic gain control signal generation means for receiving the level signal representing the level of the second modulated signal, generating an automatic gain control signal based on the received level signal, and outputting the automatic gain control signal to the tuner means,

the automatic gain control signal generation means in the first automatic gain control amplification means includes multiplication means for multiplying the level signal from the level detection means of the first automatic gain control amplification means by a first constant,

the automatic gain control signal generation means in the second automatic gain control amplification means includes multiplication means for multiplying the level signal from the level detection means of the second automatic gain control amplification means by a second constant, and

the second constant is greater than the first constant.

Claim 15 (Currently Amended) A The digital broadcast receiving apparatus according to claim 8 for amplifying a digital modulated signal wave propagated through air with gain automatically

adjusted to have a predetermined amplitude, and demodulating the digital modulated signal wave to a digital signal, the digital broadcast receiving apparatus comprising:

a tuner operable to frequency-convert the digital modulated signal wave into a first modulated signal;

a first automatic gain controller operable to control gain of said tuner to make a level of the first modulated signal at a first predetermined level;

an A/D converter operable to convert, analog to digital, the first modulated signal into a second modulated signal;

a demodulator operable to demodulate the second modulated signal into a first demodulated digital signal; and

a second automatic gain controller operable to amplify a level of the first demodulated digital signal to be at a second predetermined level, and generate a second demodulated digital signal, wherein

the second automatic gain controller includes:

a multiplier operable to receive the first demodulated digital signal and an automatic gain control signal, multiply the first demodulated digital signal by the automatic gain control signal, and output the multiplied signal as the second demodulated digital signal;

a level detector operable to receive the second demodulated digital signal outputted from the multiplier, detect a level of the second demodulated digital signal, and generate a level signal representing the level of the second demodulated digital signal; and

automatic gain control signal generator operable to receive the level signal representing the level of the second demodulated digital signal, generate the automatic gain control signal based on the received level signal, and output the automatic gain control signal to the multiplier,

the first automatic gain controller includes:

a level detector operable to receive the second modulated signal outputted from the A/D converter, detect a level of the second modulated signal, and generate a level signal representing the level of the second modulated signal; and

an automatic gain control signal generator operable to receive the level signal representing the level of the second modulated signal, generate an automatic gain control signal based on the received level signal, and output the automatic gain control signal to the tuner,

the automatic gain control signal generator in the first automatic gain controller includes a multiplier operable to multiply the level signal from the level detector of the first automatic gain controller by a first constant,

the automatic gain control signal generator in the second automatic gain controller includes a multiplier operable to multiply the level signal from the level detector of the second automatic gain controller by a second constant, and

the second constant is greater than the first constant.